1. 顺序查找： ASLsucc = sum(i / n) = (1 + n) / 2

ASLfail = sum(n / n) = n

折半查找： ASLsucc = (1 + 2 \* 2 + 3 \* 4 + … + log2(n + 1) \* 2^(log2(n + 1) - 1)) /n

= (n + 1) \* log2(n + 1) / n – 1

ASLfail = sum(log2(n + 1) / n) = log2(n + 1)

2.

node\* static\_search(int v) {

node\* p;

for(p = h; p && p->value != v; p = p->next);

return p;

}

void dynamic\_search(int v) {

node\* p, \* last;

for(last = nullptr, p = h; p && p->value != v; last = p, p = p->next);

if (last) {

if(p) {

last->next = p->next;

delete p;

}

else {

last->next = new node(v);

}

}

else {

if(p) {

h = p->next;

delete p;

}

else {

h = new node(v);

}

}

}

3.

开放定址法：

线性探测法： 优点：散列表不满总能找到不冲突地址 缺点：冲突聚集

二次探测法： 优点：不容易冲突聚集 缺点：不能总找到不冲突地址

伪随机探测法： 优点：不容易冲突聚集 缺点：不能总找到不冲突地址

再哈希法： 优点：不容易冲突聚集 缺点：计算时间增加

链地址法： 优点：不容易聚集，容易删除记录 缺点：冲突多时查找时间复杂度大

建立公共溢出区：优点：不容易聚集 缺点：冲突多时空间复杂度大

4. ①

19：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

14：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

23：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 0 | 14 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

01：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

68：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 68 | 0 | 0 | 0 | 19 | 0 | 0 |

84：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 68 | 0 | 0 | 84 | 19 | 0 | 0 |

27：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 68 | 27 | 0 | 84 | 19 | 0 | 0 |

55：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 68 | 27 | 0 | 84 | 19 | 0 | 0 |

11：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 68 | 27 | 11 | 84 | 19 | 0 | 0 |

34：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 68 | 27 | 11 | 84 | 19 | 34 | 0 |

79：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 68 | 27 | 11 | 84 | 19 | 34 | 79 |

②

19：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

14：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

23：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 0 | 14 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

01：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

68：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 0 | 0 | 68 | 0 | 19 | 0 | 0 |

84：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 0 | 0 | 68 | 84 | 19 | 0 | 0 |

27：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 01 | 14 | 0 | 27 | 68 | 84 | 19 | 0 | 0 |

55：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 0 | 27 | 68 | 84 | 19 | 0 | 0 |

11：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 0 | 27 | 68 | 84 | 19 | 0 | 11 |

34：（(1 + 25) % 11）

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 34 | 27 | 68 | 84 | 19 | 0 | 11 |

79：（(2 - 4) % 11）

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 55 | 23 | 01 | 14 | 34 | 27 | 68 | 84 | 19 | 79 | 11 |

5. ①

19：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

24：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

23：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 |

17：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 0 | 0 | 17 | 0 | 19 | 0 | 0 |

38：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 0 | 38 | 17 | 0 | 19 | 0 | 0 |

04：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 04 | 38 | 17 | 0 | 19 | 0 | 0 |

27：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 04 | 38 | 17 | 27 | 19 | 0 | 0 |

51：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 04 | 38 | 17 | 27 | 19 | 51 | 0 |

31：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 0 | 04 | 38 | 17 | 27 | 19 | 51 | 31 |

34：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 0 | 23 | 24 | 34 | 04 | 38 | 17 | 27 | 19 | 51 | 31 |

69：

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| H | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| key | 69 | 23 | 24 | 34 | 04 | 38 | 17 | 27 | 19 | 51 | 31 |

② ASLsucc = (1 + 1 + 1 + 1 + 1 + 1 + 3 + 3 + 2 + 3 + 9) / 11 = 2.36…

ASLfail = (11 + 11 + 11 + 11 + 11 + 11 + 11 + 11 + 11 + 11 + 11) / 11 = 11